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# Teachers' Perspectives on Students' Utilization of Electronic Devices for Accessing Learning Materials in Public Secondary Schools, Dodoma Region

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***Abstract***: *With growing global emphasis on Information and Communication Technology (ICT) in education, the Tanzanian government has introduced various initiatives to promote digital learning. However, a gap persists between policy and practice, particularly regarding the actual classroom use of electronic devices. Therefore, this study investigates teachers' perspectives on students' utilization of electronic devices for accessing learning materials in public secondary schools in the Dodoma Region, Tanzania. Employing a mixed-methods approach, the study involved 88 respondents, including 80 teachers and 8 school heads, across four public secondary schools. Quantitative data were analysed descriptively in terms of frequency and percents presented in tables using SPSS, while qualitative insights were derived through thematic analysis of interviews and focus group discussions. The findings reveal that teachers largely perceive electronic devices as effective tools for enhancing student engagement, promoting interactive learning, and supporting academic equity, especially for disadvantaged learners. Nonetheless, concerns emerged around device misuse, classroom distraction, and the lack of consistent infrastructure and monitoring. The study concludes that while the pedagogical potential of electronic devices is evident, their effectiveness depends on adequate teacher training, clear policy enforcement, and improved infrastructural support. Key recommendations include enhancing ICT training for teachers, enforcing device usage policies, investing in infrastructure, and promoting equity-based digital initiatives. These insights aim to inform policy and practice for optimizing ICT integration in Tanzanian secondary education.*

***Keywords:*** *ICT integration, electronic devices, Digital learning, Teachers' perspectives, and Classroom engagement.*

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## 1. Introduction

The adoption of Information and Communication Technology (ICT) in teaching and learning has revolutionized how pedagogical activities are conducted worldwide and electronic gadgets like tablets and computers have become a key tool in improving the learning process (International Telecommunication Union [ITU], 2019). The gadgets facilitate access to online materials, collaboration, and online learning in all disciplines (Mtega et al., 2020). The United States has more than 85 percent of the educational institutions globally, and 90 percent of United Kingdom teachers in

secondary schools use electronic devices in their teaching, which makes them realize their potential in contemporary education (UNESCO, 2022). On the same note, African countries, such as Kenya and South Africa, have also introduced ICT programs to educate the uneducated masses (Alaba, 2019; Kajumbula, 2019).

In Tanzania, the government has shown interest in ICT integration with a policy like the ICT Policy for Basic Education (2007) designed to enhance the quality of education and national development objectives (Ministry of Education and Vocational Training [MoEVT], 2014). Programs such as the Tanzania Secondary Education Quality Improvement Project (SEQUIP) have provided digital literacy training to more than 15,000 teachers, and the Universal Communication Service Access Fund (UCSAF) has supplied schools with devices and has also trained educators in ICT (Gibbons et al., 2018). Nevertheless, researchers have found an opposite, as despite the efforts, teachers and students do not use electronic devices in academics, despite the wide availability of technology (Gibbons et al., 2020). An example is where mobile phones are prohibited in schools, but tablets and computers made available under government programs are not fully utilized to access learning materials.

This imbalance casts important doubts on the efficiency of ICT integration policy within Tanzanian state schools. The aspects in which current studies note issues include inadequate infrastructure, a lack of teacher readiness, and restrictive policies regarding the use of devices (Kihwele & Bali, 2022; Mtebe et al., 2019). In Dodoma, where physical learning resources are in short supply, the possibilities of electronic devices to address the lack of resources have not been pursued actively. This research project examines the views of the teachers on the use of electronic devices by the students to get learning materials in the public secondary schools within the Dodoma Region. The study will inform policy changes and streamline ICT-based educational policies in Tanzania by analyzing the opinions of educators. This study evaluates students' perceptions of electronic devices as learning tools in Dodoma's public secondary schools. It addresses the following research questions:

1. How do teachers perceive the effectiveness of electronic devices in enhancing students' access to learning materials in public secondary schools within Tanzania's Dodoma Region?
2. What institutional and infrastructural barriers impede the integration of electronic devices into pedagogical practices for accessing learning materials, as reported by teachers in Dodoma's public secondary schools?
3. What policy or practical interventions do teachers recommend optimizing the utilization of electronic devices for academic purposes in alignment with Tanzania's ICT integration goals?

# 2. Literature Review

## 2.1 Empirical Studies

Information and Communication Technology (ICT) has changed the way education is done all over the world. Tablets, computers, and mobile phones are electronic gadgets that are becoming known as transformative tools to make learning content more accessible and help create collaborative learning experiences (ITU, 2019). Social tools such as mobile teleconferencing and text messaging can be used to provide real-time communication among teachers and students to share resources and manage schedules in a variety of educational settings (Brown, 2018; Kihwele and Bali, 2022). In other science classes, such as chemistry, learners can see chemical reactions in 3D and learn formulae, whereas language classes will enjoy vocabulary-boosting tools (Twum, 2020; Kheider, 2021). The use of electronic devices in schools has been institutionalized to occur in curriculums in countries such as the USA, UK, Japan among others, and more than 85 percent of educational institutions in the USA embrace the use of tablets and laptops (Shaw, 2023). These efforts highlight the importance of ICT in redressing disparities in education and advancing skills of the 21st century.

ICT integration has been adopted as a way of modernizing education systems in African countries such as Tanzania. Mobile learning has the potential to address traditional pedagogical constraints, especially where access to resources is limited, as seen in South Africa, Kenya, and Uganda (Alaba, 2019; UNESCO, 2020). The ICT Policy on Basic Education in Tanzania (2007) is designed to help the country implement technological tools in the schools to become a knowledge-based economy by 2025 (MoEVT, 2014). By 2021, the government had provided 31,445 desktop computers and 10,932 laptops to secondary schools and had trained 15,282 teachers with STEM education and digital literacy initiatives such as SEQUIP (Gibbons et al., 2018). Some pilot projects like giving the teachers tablets were shown to enhance content delivery and student engagement (Mtebe et al., 2019). Nonetheless, electricity is not available in all Tanzanian secondary schools (72.2%), and there is an unequal distribution of device access (mainly in rural schools) (COSTECH, 2021).

As much as the ICT policies in Tanzania imply such aspirations, there are still practical challenges. School policies frequently ban mobile phone use by students, arguing that it distracts them, even though studies have shown it can be useful in school (Gafni et al., 2017; Leyden, 2020). The infrastructural barriers reported by teachers include poor electricity supply, inadequate

devices, and technical support (MOEST, 2024). Also, even though training programs such as UCSAF 2021 taught 650 teachers ICT skills, the scale issue still poses a problem. Research on the use of electronic devices by teachers in Tanzania by Gibbons et al. (2020) indicates that many teachers involved do not fully utilize electronic devices because they lack awareness of their educational potential, which continues to create a disconnect between policy goals and classroom practice.

## 2.2 Theoretical Framework: Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) describes the process of technology adoption using five primary variables that connect directly with this research on the adoption of electronic devices by teachers in Tanzania. First is perceived usefulness; this is related to the degree to which teachers feel that the use of electronic devices will enhance their teaching quality, such as increasing the quality of delivering lessons or student engagement. Second, the perceived ease of use pertains to the perceptions of these teachers on whether they think these technologies are easy and convenient to use in their daily work, the technology may be viewed as too complicated and therefore it will not be adopted despite its possible usefulness. These two perceptions influence the third component, attitude toward use, which represents the general positive or negative attitudes of teachers to using devices in classroom practice. The fourth component, behavioral intention to use, is then affected by attitudes and is the willingness or intention of the teachers to use the technology in their teaching. Lastly, actual use of technology is the fifth component, which means actual use of technological devices like mobile phones, tablets or computers to prepare lessons, to learn or to manage classes. By doing so, TAM will offer an effective conceptual framework through which the views of teachers and their perceptions and attitudes can be determined regarding their willingness to embrace electronic devices, which is critical in ensuring the realisation of the educational policy objectives of ICT integration in Tanzania.

## 2.3 Knowledge Gaps

Empirical research points at differences in device use. In their research conducted in the Kibiti District, Mwita (2020) discovered that school-banned mobile phones were largely used by secondary students to socialize, more than to study, and that the school bans supported this behavior. On the other hand, pilot studies conducted in Tanzania have shown that the systematic use of devices has a beneficial effect on learning outcomes, implying that policy implementation and teacher education play a key role (Mtebe et al., 2019). Nevertheless, a few studies discuss how teachers view the process of overcoming institutional obstacles or maximizing the use of devices in the public schools of Dodoma. Current literature places emphasis on student behavior or lack of infrastructures, but not on the role of the educators as intermediary to ICT integration.

# 3. Methodology

In this research, a mixed approach was used coupled with convergent parallel mixed method design to examine the attitudes of teachers regarding the use of electronic devices by students to access learning materials. The quantitative phase was used to collect numerical data on patterns of device use through structured questionnaires, whereas the qualitative phase was used to collect information on experiences and institutional issues of teachers using focus group discussions (FGDs) and interviews. The research took place in Dodoma Region, the capital of Tanzania, where four government secondary schools in Dodoma which was were selected purposely, according to their involvement in national-level ICT integration programs. The target population was teachers in secondary schools, students and school heads. The sample of 80 teachers (40 male, 40 female) in science, humanities and vocational subjects was selected through stratified random sampling technique, in order to represent gender and subject. Further, 8 school leaders were selected on a purposive basis to provide insights on policies. In order to give contextual information about device use patterns, students (n=100) were chosen randomly, however, the main emphasis was made on the views of teachers.

**Table 1: Distribution of Study Sample size**

| Category | Number of Participants |
|---|---|
| Male Teachers | 40 |
| Female Teachers | 40 |
| School Heads | 8 |
| **Total** | **88** |

Data Collection section describes systematic details of collecting data with three main categories in the context of schools: teachers, students, and school heads. Stratified random sampling was used to select teachers so as to have

equal gender representation (40 males and 40 females), and balance in academic disciplines (science, humanities, vocational). This is a way of ensuring diversity in opinions and minimizing prejudice. A purposive sample of heads of schools (8 total) was selected, based on those with direct policy-related experience to offer institutional insight. The selection of students (n=100) was made at random to collect contextual information on how students use their devices, although, their feedback was secondary to the focus on the opinion of teachers. The multi-tiered approach will provide the dataset with breadth (trends among students) and depth (teacher and administrative viewpoints).

The SPSS, Version 26, was used to analyze the quantitative data collected through questionnaires. Frequencies and percentages were calculated and used to give a summary of responses using descriptive statistics. The qualitative data were analyzed thematically according to the five stages of analysis developed by Creswell (2014): transcription, familiarization, coding, theme identification, and interpretation. FDG and interview transcripts generated recurrent themes, including, but not limited to, device accessibility, pedagogical impact, and policy enforcement. Quantitative and qualitative results were triangulated to provide a holistic view of the perceptions of students and contextual issues (Johnson & Christensen, 2014).

# 4. Results and Discussion

This section begins by providing the demographic profile of the respondents. It provides the characteristics of the respondents in terms of gender, age, students' class level, teachers' qualification, and marital status, with a sequence of findings based on the research objective.

## 4.1 Respondents' Demographic Data

The demographic distribution of the respondents offers valuable insights aligned with the study's objective of understanding teachers' perspectives on students' use of electronic devices in public secondary schools in Dodoma Region. Table 2 shows the demographic data of the study.

**Table 2: Demographic Characteristics of the Respondents**

| | Frequency | Percentage (%) |
|---|---|---|
| Respondent Type | | |
| Teachers | 80 | 90.9% |
| Heads of Schools | 8 | 9.1% |
| **Gender** | | |
| Male | 40 | 45.5% |
| Female | 48 | 54.5% |
| **Age Group** | | |
| 25–35 years | 30 | 34.1% |
| 36–45 years | 35 | 39.8% |
| Above 45 years | 23 | 26.1% |
| **Professional Qualification** | | |
| Diploma | 20 | 22.7% |
| Bachelor's Degree | 50 | 56.8% |
| Master's Degree | 18 | 20.5% |
| **Marital Status** | | |
| Married | 58 | 65.9% |
| Unmarried | 30 | 34.1% |

**Demographic Characteristics of the Respondents**

Among the 88 respondents, most were classroom teachers (90.9%), and 8 school heads (9.1%), added supervisory commentaries. This combination guarantees an equal representation of instructional and administrative positions. There was a 54.5 per cent to 45.5 per cent bias towards females as the gender representation, which

indicated that there is progressive gender inclusion among education professionals in the Dodoma public schools. The data of the age groups shows that the majority of the respondents (74% of them) were of productive teaching age (25-45 years) and were actively involved in classroom activities and introduced to technology. Regarding qualifications, more than half (56.8%) had bachelor's degrees, and 20.5% had master degrees, demonstrating a fairly clearly well-qualified sample able to evaluate and incorporate educational technology. There were also fewer diploma holders (22.7), which suggests that the trends of continuous professional development among teaching staff are continuing. Lastly, marital status information indicates that most of them (65.9%) were married, which can impact on their habit of balancing work and life use of technology both in school and at home. On the whole, the validity and importance of these findings are enhanced by this demographic profile, as it guarantees the contribution of a professional and heterogeneous teaching staff engaged in technology-based learning.

## 3.2Teachers, Perspective on Students' Electronic Use

This section highlights teachers' views on students' use of electronic devices in learning. Their perspectives reveal both benefits, such as improved engagement and support for diverse learners, and challenges, including distractions and unequal access. Table 3 summarizes these insights.

**Table 3: Teachers' Perspective on Students' Electronic Use**

| Perspective | Frequency | Percentage (%) |
|---|---|---|
| Enhanced Engagement | 12 | 75% |
| Use of Interactive Apps | 8 | 50% |
| Easier Learning for Visual Learners | 10 | 62.5% |
| Loss of Instructional Time (Distraction) | 9 | 56.25% |
| Positive Classroom Environment | 11 | 68.75% |
| Providing Access to Learning Materials | 7 | 43.75% |
| Reduced Educational Inequalities | 6 | 37.5% |

Viewpoints of teachers regarding the use of electronic devices by students exposed learning opportunities and challenges to the learning process. Most of them recognized that the devices increase engagement (75%), create favorable classroom experiences (68.75%), and support learning in multiple learning styles, especially visual learners (62.5%). One teacher explained,

> *"When students use tablets and phones for class exercises, I notice that even those who are usually quiet and hesitant in discussions begin to participate more actively. The colors, images, and interactive nature of the apps capture their attention and make them curious to contribute, which has improved overall engagement in my classroom."* ***(Teacher A, April 2025)***

The results reflect those who find that digital tools facilitate active, student-centered learning and increase motivation (Bleher, 2017, and Bano et al., 2018). Likewise, Mayer (2020) and Hillmayr et al. (2020) show that multimedia and visual resources have a significant positive impact on understanding and performance in major subjects. There were some concerns though, and the risk of distraction, and lost instructional time were mentioned by more than half (56.25) of the teachers. As one school head noted,

> *"Although electronic devices have potential, I have observed that some learners end up opening social media sites or chatting with friends during lessons instead of focusing on the teacher's instructions. This misuse not only*

*disrupts the lesson but also forces teachers to spend additional time monitoring rather than teaching, which creates unnecessary tension in managing class discipline."* ***(*School Head, *April 2025)***

This is consistent with the findings of Flanigan and Babchuk (2020) and Felisoni and Godoi (2020) which state that too much device use can be detrimental to attention and academic performance. Alternatively, almost half of teachers (43.75) stated the importance of devices as a means of access to learning materials, and 37.5% mentioned the role of devices in mitigating learning disparities. A classroom teacher remarked, *"*

*For many of my students who cannot afford personal textbooks or who come from disadvantaged families, the availability of shared phones and electronic books has been a game changer. They can download notes, access assignments, and even share study materials with peers, which creates a more level playing field in the classroom and ensures that no one is completely left behind."* ***(Teacher B, April 2025)***

These findings are consistent with those of UNESCO (2022), which emphasizes the promising capabilities of technology to reduce learning gaps in disadvantaged settings, and with Kihwele and Bali (2022), who concluded that mobile devices in Tanzania can play a vital role in eliminating socio-economic gaps in education. In general, the results demonstrate that electronic devices pose the risk of distraction but can be effectively used in the learning and teaching process as the most powerful tools of engagement, inclusivity, and accessibility to resources.

### 4.2.1 Electronic Devices Enhance Engagement and Learning Outcomes

The positive influences of electronic devices in promoting student interaction and enhancing student learning were greatly recognized among teachers of Dodoma Region. Most (75 percent) noted that even the employment of gadgets like tablets and smartphone devices will make learners eager to engage, particularly when it comes to educational videos, applications, and simulations. Also 62.5 percent noted that visual learners are better served by multimedia materials than textbooks. One of the participants said that,

*"Students become more eager to participate when using interactive learning apps, particularly in subjects like science and mathematics," noted one teacher. "This was not easily achievable with chalk-and-talk methods."* ***(Teacher I, April 2025)***

These results are consistent with prior studies by Alghamdi and Holland (2022), who identified that interactive digital tools facilitate differentiated instruction and enhance motivation in secondary education. Similarly, Chigona et al. (2021) note that mobile learning technologies can encourage collaboration in the learning process and stimulate additional comprehension in students. More so, Bervell and Umar (2017) claim that ICT integration makes pedagogy richer because it focuses not on passive reception of knowledge but on active knowledge-building, and in turn, helps students develop critical thinking skills. Collectively, these views serve to highlight how electronic devices are not merely auxiliary resources but also key catalysts of contemporary pedagogical change, and can facilitate engaging student-centered learning environments, when successfully incorporated into classroom activities.

### 4.2.2 Challenges of Distraction and Loss of Instructional Time

Although it has a good side, 56.25% of the respondents mentioned that electronic devices also create distractions. Educators noted that there were cases when students were using their devices to access social media or play games during the lessons. This abuse causes a drop in discipline

and teaching effectiveness. One teacher shared: *"Despite clear rules, students still manage to use devices to browse entertainment sites, which undermines class discipline."* ***(Teacher D, April 2025)***. Experiments like those carried out by Thomas and O'Bannon (2020) and others have supported this observation, with the authors noting that the use of electronic devices in the classroom is often unsupervised and thus associated with poor academic performance and behavioral problems. The challenge is further complicated by the fact that managing large classes is quite difficult because a teacher is not able to keep track of all students. The fact that digital tools were not efficiently regulated and used in more than a single instance is supported by Alhumaid (2019), who believed that such habits should be discouraged initially since they lead to disrupted attention in students, thus making them less capable of concentrating on their most important duties. Moreover, Sung, Chang, and Liu (2016) note that technology can improve interaction; however, its abuse frequently undermines quality classroom interactions. These observations highlight that the effectiveness of integrating electronic devices does not solely rely on access but also on efficient classroom management and digital literacy training of students and teachers. The opportunities that electronic devices can bring to learning might be obscured by the possibility of their destabilizing teaching time in the absence of such protections.

### 4.2.3 Promoting Educational Equity through Device Access

Remarkably, 43.75% of the teachers have admitted that electronic devices allow access to learning resources that would otherwise be inaccessible to disadvantaged students. Approximately half focused on how technology can help lessen the disparities in education and particularly in areas where textbooks and other physical resources are limited. As one teacher stated, *"Students who had no access to textbooks now revisit lessons via smartphones at home. This has improved both their confidence and participation in class."* ***(Teacher A, April 2025).*** Expanding on these ideas, the results show how electronic devices are not only auxiliary tools but drivers of inclusiveness in education. Teachers noted that technology presents possibilities to learners frequently sidelined through structural constraints, including small libraries or learning resources that are no longer up to date. One teacher elaborated,

> *"In my experience, many of our students previously struggled because they shared one textbook among five or more peers, which restricted their ability to study after school. Now, with smartphones, even those from the poorest households can access class notes, audio explanations, and past exam questions at any time. This freedom to learn beyond the classroom has narrowed the gap between high achievers and those who were always left behind."* ***(Teacher D, April 2025)***

This helps affirm claims made by UNESCO (2023), who emphasize that e-learning tools are essential in bridging the learning gap, especially in low-resource settings. Moreover, research by Tella and Olanrewaju (2021) revealed that educational technology increases performance in rural and underserved student groups. These views are echoed by Kihwele and Bali (2022), who state that digital tools can act as an intermediary between disadvantaged learners and the knowledge economy by providing a means to level the playing field and ensure equal access to knowledge. However, there are still questions related to digital divides associated with affordability, internet access, and proper teacher training. In this regard, though electronic devices show a strong potential in fostering equity, their long-term effect needs well-rounded support mechanisms, such as policy interventions, investment in infrastructures, and continuous professional development of teachers.

# 5. Conclusion and Recommendations

## 5.1 Conclusion

The results of this research indicate that the perceptions of teachers in government secondary schools in the Dodoma Region with respect to the use of electronic devices by students in accessing learning resources are largely positive. The majority of educators recognize that such devices can improve classroom learning, encourage collaborative learning, and accommodate different learning styles especially among visual learners, with innovative interactive and multimedia-based learning materials. Further, electronic devices have been known to be crucial in combating educational gap, particularly among learners who are underprivileged to access physical text books due to the resource constraints nature. Nevertheless, the research also sends a message about serious issues,

especially the abuse of devices and their distractive functions that undermine teaching and classroom behavior. The difficulty in monitoring the use of the devices by students in large classes adds to the severity of these concerns. Although such was the case, most teachers are hopeful of the role that technology plays in education as long as the right policies, well-organized monitoring and proper infrastructure are established. In conclusion, the introduction of electronic devices in learning with the guidance of teacher preparedness and institutional support promises to enhance quality and equity of education in the Tanzanian public secondary schools.

## 5.2 Recommendations

Based on the research findings, the study puts forward several recommendations aimed at improving the students' use of electronic devices while accessing learning materials in secondary schools.

1. Firstly, school management should implement a strict policy and surveillance systems within schools to direct the use of electronic equipment in classes. Authoritarian rules, along with computer surveillance and classroom management measures, would assist in minimizing distractions and abuse, so devices are not wasted on other activities.
2. Secondly, teacher professional development should be advanced by enrolling teachers into continuous training programs. These programs must provide educators with online pedagogical skills, methods of incorporating technology into the curriculum and classroom management methods specifically tailored to device use. Increasing teacher capacity will allow schools to make sure that technology helps us learn instead of causing disruptions.
3. Third, it is essential to invest in connectivity and infrastructure. Stakeholders of the education sector and the government should focus on the availability of good internet connections, installation of charging points, and pocket-friendly devices to facilitate digital education. This would help especially students in disadvantaged backgrounds, and no learner would be left behind because of inability of accessing the resources.
4. Fourth, access and equity to the use of devices in schools and policies should be encouraged. Initiatives like subsidized or shared devices among low-income students may be an effective way to close the gap between privileged and underprivileged learners. Collaborations with the third sector, nongovernmental organizations, and other international entities might also be useful in the provision of low-cost devices and e-resources.
5. Fifth, the creation of contextualized content, specific to the Tanzanian curriculum, must be encouraged. Electronic learning would be more accessible and meaningful to students and would also meet national education standards, with culturally relevant examples that would be offered in localized digital learning material in both Kiswahili and English.
6. Lastly, it is important to reinforce parental and community involvement. Home environments should be supported by sensitizing parents and the community on the importance of electronic devices in education. By collaborating with communities, schools should also control device usage outside classrooms to reduce misuse and support productive usage. On the national scale, electronic device use must be incorporated into ICT-in-education policies that the Ministry of Education strongly supports in terms of implementation, monitoring, and evaluation. These policies would be reviewed regularly to provide flexibility in the face of new challenges in the digital education environment.

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